

S/N: 09/663,515

Atty Dkt No. FMC 1263 PUS / 200-0029

Remarks

In response to the Final Rejection of December 4, 2002, Applicants have cancelled Claims 1, 3, 4, 10-15 without prejudice and amended Claims 5-9, all in an effort to place this case in condition for allowance or in better form for Appeal. Applicants' attorney appreciates the recent telephone conversation with the Examiner regarding this case. The Examiner has indicated that he will discuss the matter with his Primary.

The present invention is concerned with controlling the engine in order to "reduce the number of times that the engine ... is turned on solely for supporting non-propulsive or ancillary functions performed by these auxiliary systems to thereby enhance both fuel economy and reduce engine emissions" (page 2, line 27).

The Examiner has rejected Claims 2, 5-9 and 21-22 under 35 U.S.C. §103(a) as unpatentable over Brigham et al and Ibaraki et al as discussed in the previous Office Action and further in view of the newly cited Kinugasa et al. Such rejection is respectfully traversed. Applicants have discussed the Brigham and Ibaraki references in the Response to the previous Office Action. The newly cited Kinugasa reference adds nothing to the previously cited art and indeed is not pertinent to Applicants' invention as claimed, it being related to control of a NOx trap. The text in Kinugasa reference at Column 13, lines 36-38, cited by the Examiner as support for his position that the engine be switched ON or OFF for suppressing fluctuations in output torque (which has nothing to do with Applicants' invention) is reproduced below:

To solve the above problem, the amount of NH_3 adsorbed in the NH_3 --AO catalyst 14a, that is, the adsorbed NH_3 amount is found, and when this adsorbed NH_3 amount exceeds a predetermined upper threshold $\text{UT}(\text{NH}_3)$, the switching valve 25 is turned OFF to stop feeding the exhaust gas of the auxiliary engine 20 into the exhaust pipe 7. As a result, the excess NH_3 is prevented from being discharged without being adsorbed in the NH_3 --AO catalyst 14a. (Emphasis added.)

Thus, it is clear that it is not the engine that is turned ON or OFF, as relied upon by the Examiner, it is the switching valve 25.

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The Examiner's rejection of Claim 2 has never addressed the limitation in the claim that call for a window, discussed in the Specification at page 6 beginning at line 25, and mentioned in the previous Office Action. Claim 2 recites:

determining whether the value of an auxiliary system parameter is within or outside a window defined by first and second threshold values;

requesting a change of status from OFF to ON if the value of the parameter is outside said window and greater than said second threshold value; and

requesting a change of status from ON to OFF if the value of the parameter is outside said window and greater than said first threshold value.

As discussed in the Specification in the case of the HVAC, the auxiliary system parameter is temperature and the comfort level desired by the occupant will determine the temperature to be achieved. As discussed at page 6 beginning at line 25, the upper and lower thresholds are offset by, for example, 2° F, from the desired temperature set by the operator to establish a 4°F calibratable window or deadband. No reference cited by the Examiner teaches this concept of a window or deadband to avoid excessive cycling of the engine, i.e., the number of times "a main power unit of a hybrid electric vehicle is activated to supply power to an auxiliary system of the vehicle during a given drive cycle", as recited in Claim 2. This window is also recited in system Claim 22 and dependent Claim 23.

Applicants have amended Claim 9 to incorporate the limitations of Claims 1 and 3 from which it depended, and have cancelled Claims 1 and 3. Claim 9 claims the invention depicted in one embodiment in Fig. 2. There the engine is switched ON if any one of a plurality of auxiliary systems require support and the engine, once ON, is maintained ON until none of the plurality of auxiliary systems require support. More particularly, after reciting the steps of checking the ON/OFF status of the unit or engine, setting ON or OFF auxiliary threshold values depending on the status of the unit, requesting that the unit be maintained ON until the value of an auxiliary system parameter exceeds a unit ON auxiliary system threshold value or, if OFF, turned ON when the value of an auxiliary system parameter falls below a unit OFF auxiliary system threshold value, Claim 9 recites:

wherein said step of requesting that a unit ON status be maintained is performed if a predetermined parameter in any of said plurality of auxiliary systems is below respective unit ON auxiliary

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system threshold values, and said step of requesting a unit ON status is performed if a predetermined parameter in any of said plurality of auxiliary systems is below respective unit OFF auxiliary system threshold value.

No prior art has been cited by the Examiner that suggest the invention defined by Claim 9. Original Claims 5-8 have been amended to depend from Claim 9 and further define the invention.

In view of these Remarks, it is submitted that Claims 2, 5-9 and 21-22 are allowable over the references of record and that the application is otherwise in condition for allowance; and notice of such is respectfully solicited. Alternatively, it is requested that this amendment be entered as placing the case in better form for appeal.

Please charge any fees associated with the filing of this Amendment to the deposit account of Ford Global Technologies, Inc., No. 06-1510.

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

5. (Amended) The method of Claim 2 [1] wherein said auxiliary system is a brake booster vacuum system.
6. (Amended) The method of Claim 2 [1] wherein said auxiliary system is an air conditioning and heating system.
7. (Amended) The method of Claim 2 [1] wherein said auxiliary system is a purge vapor system.
8. (Amended) The method of Claim 2 [7] wherein said auxiliary system is a catalyst system.
9. (Amended) [The method of Claim 3] A method of reducing the number of times a main power unit of a hybrid electric vehicle is activated to support a plurality of auxiliary system of the vehicle during a given drive cycle comprising a sequence of the following steps:
determining the ON/OFF status of said unit;
if the unit is ON requesting that the unit be maintained ON until the value of an auxiliary system parameter exceeds a first threshold value wherein said first threshold value is a unit ON auxiliary system threshold value;
if the unit is OFF requesting that the unit be turned ON when the value of said parameter falls below a second threshold value wherein said second threshold value is a unit OFF auxiliary system threshold value;
setting said unit OFF auxiliary system threshold value when the status of said unit is OFF;
setting said unit ON auxiliary system threshold value when the status of said unit is ON; and
 wherein [said vehicle includes a plurality of auxiliary systems and] said step of requesting that a unit ON status be maintained is performed if a predetermined parameter in any of said plurality of auxiliary systems is below respective unit ON auxiliary system threshold values, and said step of requesting a unit ON status is performed if a predetermined parameter in any of said plurality of auxiliary systems is below respective unit OFF auxiliary system threshold value.

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